Name: Date:

Polynomial Factoring solution (version 603)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 2x + 28 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(28)}}{2(1)}$$

$$x = \frac{-(-2) \pm \sqrt{4 - 112}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-108}}{2}$$

$$x = \frac{2 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{2 \pm 6\sqrt{3}\, i}{2}$$

$$x = 1 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 - 8i$ and $-4 - 6i$ in standard form $(a + bi)$.**

Solution

$$(-2 - 8i) \cdot (-4 - 6i)$$

$$8 + 12i + 32i + 48i^2$$

$$8 + 12i + 32i - 48$$

$$8 - 48 + 12i + 32i$$

$$-40 + 44i$$

Polynomial Factoring solution (version 603)

3. **Write function $f(x) = x^3 + 2x^2 - 9x - 18$ in factored form. I'll give you a hint: one factor is $(x - 3)$.**

Solution

	1	2	-9	-18
3		3	15	18
	1	5	6	0

$$f(x) = (x-3)(x^2+5x+6)$$

$$f(x) = (x-3)(x+3)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+4)^2 \cdot (x-1)^2 \cdot (x-6)$$

Sketch a graph of polynomial $y = p(x)$.